

REDUCTION OF CARROT DEFECTS IN SILICON CARBIDE EPITAXY

ABSTRACT

Single crystal silicon carbide epitaxial layer on an off-axis substrate are
5 manufactured by placing the substrate in an epitaxial growth reactor, growing a first
layer of epitaxial silicon carbide on the substrate, interrupting the growth of the first
layer of epitaxial silicon carbide, etching the first layer of epitaxial silicon carbide to
reduce the thickness of the first layer, and regrowing a second layer of epitaxial
silicon carbide on the first layer of epitaxial silicon carbide. Carrot defects may be
10 terminated by the process of interrupting the epitaxial growth process, etching the
grown layer and regrowing a second layer of epitaxial silicon carbide. The growth
interruption/etching/regrowth may be repeated multiple times. A silicon carbide
epitaxial layer has at least one carrot defect that is terminated within the epitaxial
layer. A semiconductor structure includes an epitaxial layer of silicon carbide on an
15 off-axis silicon carbide substrate, and a carrot defect having a nucleation point in the
vicinity of an interface between the substrate and the epitaxial layer and is terminated
within the epitaxial layer.